Central Street
Walk Audit Report

City of Lowell
Department of Planning & Development

Content

Vocabulary List

Walking

An inclusive term that includes all people, irrespective of their choice of mobility device to travel at human speed

Pedestrian-Scaled Lighting

Light fixtures are positioned lower than roadway lighting, are placed more closely together and are directed towards the sidewalk

Source: Pinterest

Signalized Pedestrian Crossing

Indications at a traffic signal for pedestrians that show walk/don't walk symbols and countdown timers that help pedestrians complete crossing the entire street

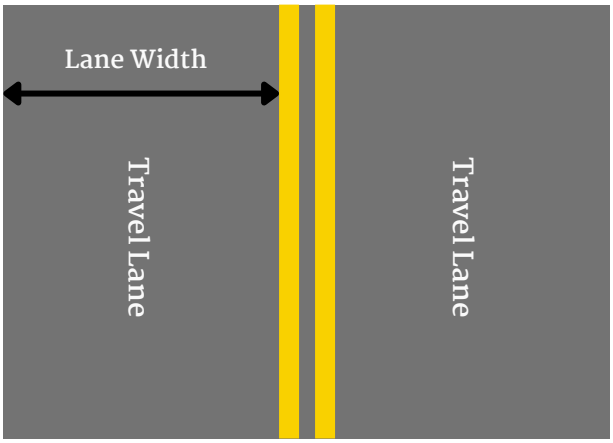
Source: New York Post

Walk Audit

An activity to evaluate the walking environment and identify opportunities to improve safety and comfort for pedestrians

Travel Lane

The space on the street allocated for motorized vehicles. The width of this space is called the lane width, which is usually 12 feet or wider for highways and 9 to 15 feet for city and suburban streets



Bike Lane

A dedicated space on the street for cyclists. The recommended width for on-street bike lanes is 6 feet if no buffer is provided

Source: Highways.dot.gov

Curb Cut

Ramp (or ADA-compliant Ramp): A graded ramp from the top of the sidewalk to the

street surface for smooth passage of mobility devices, cycles and/or strollers

Source: Carleton.edu

Tactile Warning Surface

Areas with raised bumps on sidewalks or curb ramps to alert pedestrians who have impaired vision or are blind that they are leaving the sidewalk and entering the street

Source: FHWA

Sidewalk

Paved path for pedestrians at the side of the street. To be ADA-compliant, sidewalks must be a minimum of 5 feet wide. Additional with is necessary where two people would desire to walk together

Crosswalk

Painted lines that indicate to pedestrians where to cross a street and signal to drivers where to expect pedestrians and yield. Crosswalks are marked with white pavement markings and extend the length from curb to curb

RRFB

A Rectangular Rapid Flashing Beacon is a device that flashes when activated by pedestrians to enhance their visibility and driver yielding at uncontrolled (not at a signal) crosswalks

Source: Highways.dot.gov

Pedestrian Island

A raised area, usually concrete, between vehicle travel lanes where pedestrians can safely wait between crossing each direction of traffic.

Source: Highways.dot.gov

Vulnerable Road User

Road users that are not in a car, bus or truck. Generally considered to include pedestrians, motorcyclists, bicyclists, children, older adults, and those with mobility devices.

Title: View of Lowell, 1834, by E. A. Farrar; Source: UMass Lowell Library

Introduction

Historically, Lowell evolved as a "Walking City", with the Downtown district industrialized before the invention of the personal vehicles. Residents generally lived within walking distance of the mills where they worked, and the urban core developed to support these mill workers. Larger cities like Boston, New York and Philadelphia began evolving extensive transit systems to move people without the use of a car. However, Lowell continued to remain a walking city, with city streets filled with pedestrians and travel supported by trolleys and streetcars. Slowly, with the development of new neighborhoods away from Downtown, walking became less desirable over time and the streetcars and trolleys vanished. After decades of street design prioritizing motorized vehicles, walking and biking has regained popularity.

To address a growing demand for a safe, comfortable, accessible and connected pedestrian infrastructure network, the City of Lowell is preemptively reviewing high-pedestrian demand areas to inform future improvements and capital investments. The first tool the City of Lowell has introduced is the practice of conducting walk audits to hear the challenges and opportunities of the community stakeholders regardless of their age, income, disability or mobility difference.

A walk audit is an activity where people from the community, including residents, business owners and regular street users evaluate a corridor or an area on how friendly it is for pedestrians to walk to their destinations. This activity helps the City assess the walkability of a street and identify where improvements can be made in the short and long term.

So, what does walkability mean?

Walkability is about making a street inviting, safe, and comfortable for pedestrians. Walking is an inclusive term that encompasses all forms of pedestrian mobility.

"A street is not considered walkable just because it has a sidewalk."

Walkable streets can be created through thoughtful design, including providing wider sidewalks, adding street trees and lighting, ensuring physical separation from vehicular traffic, reducing vehicle speeds, creating

visible street crossings and opening the street to more users, including those with mobility devices or strollers. Walkable streets create an environment that makes the decision to walk easier, accessible, and more enjoyable!

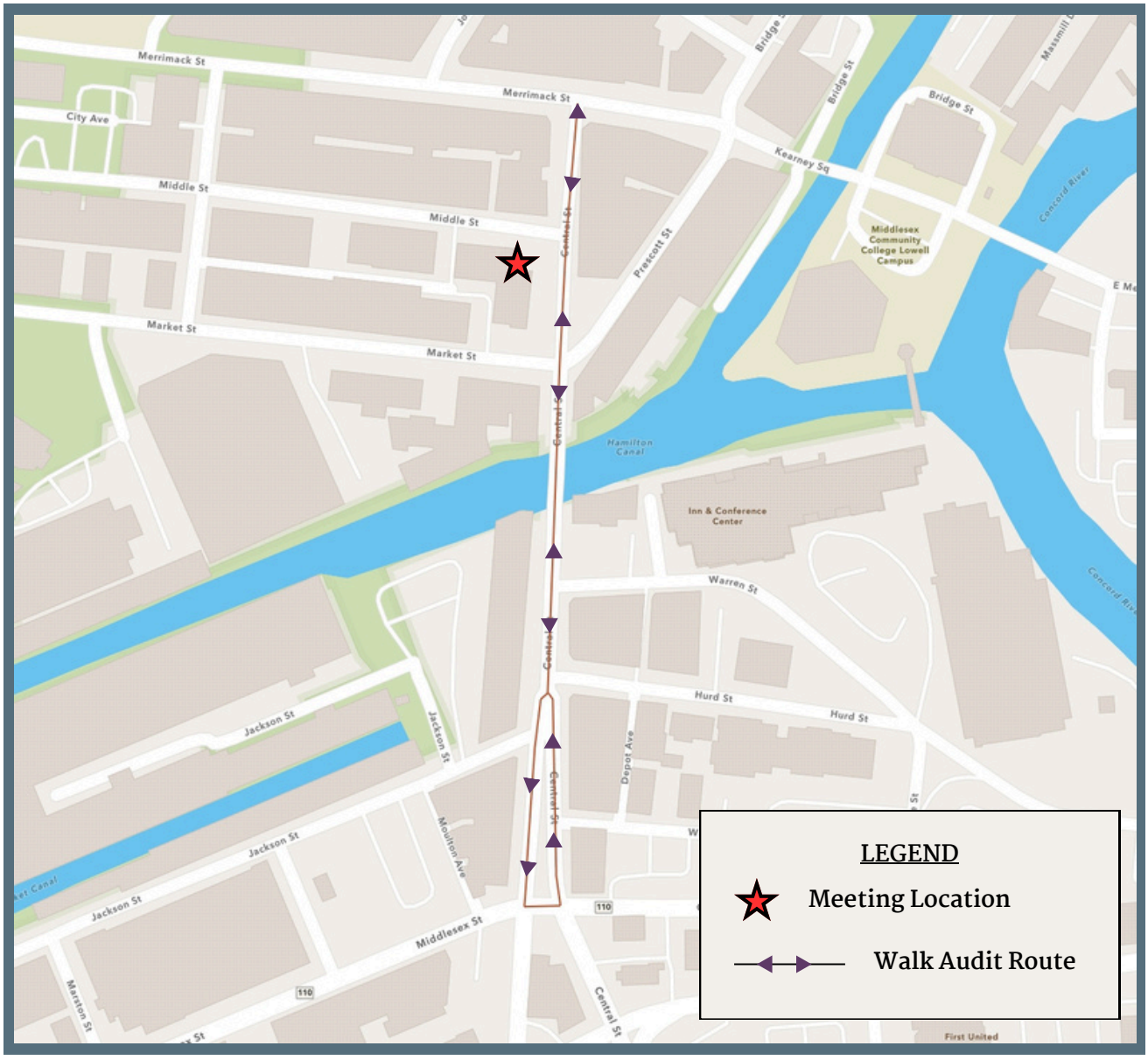
Walkable Street; Source: usgbc.org

Walk Audit

On October 24, 2024, the City conducted its first walk audit on Central Street. The walk included approximately 0.25 miles along Central Street between Middle Street and Middlesex Street. Over the one-hour walk, observations and insights shared by the participants were recorded for formulating short-term and long-term goals for the street.

Central Street

Central Street is one of the busiest vehicle volume streets in Lowell with an average of 13,000 vehicles traveling the corridor per day. This street has many mixed-use developments allowing people to work and shop where they live, indicating a high potential for walking on this street.



Central Street walk audit route

Mixed use building on Central Street

Central Street & Merrimack Street intersection

Crash Data Analysis

One of the first steps in determining the safety of a particular street is to evaluate the number, severity and type of crashes that have occurred on the street. Between January 2021 and September 2024, there were a total of 128 crashes along the 0.25-mile Central Street corridor studied, with 14 crashes involving vulnerable road users (VRU). Out of the 128 crashes, 98 occurred at intersections of side streets with Central Street. About 15% of the total crashes involved vulnerable road users (VRU). The table provides a summary of crash data obtained from the MassDOT Crash Data Portal along the corridor.

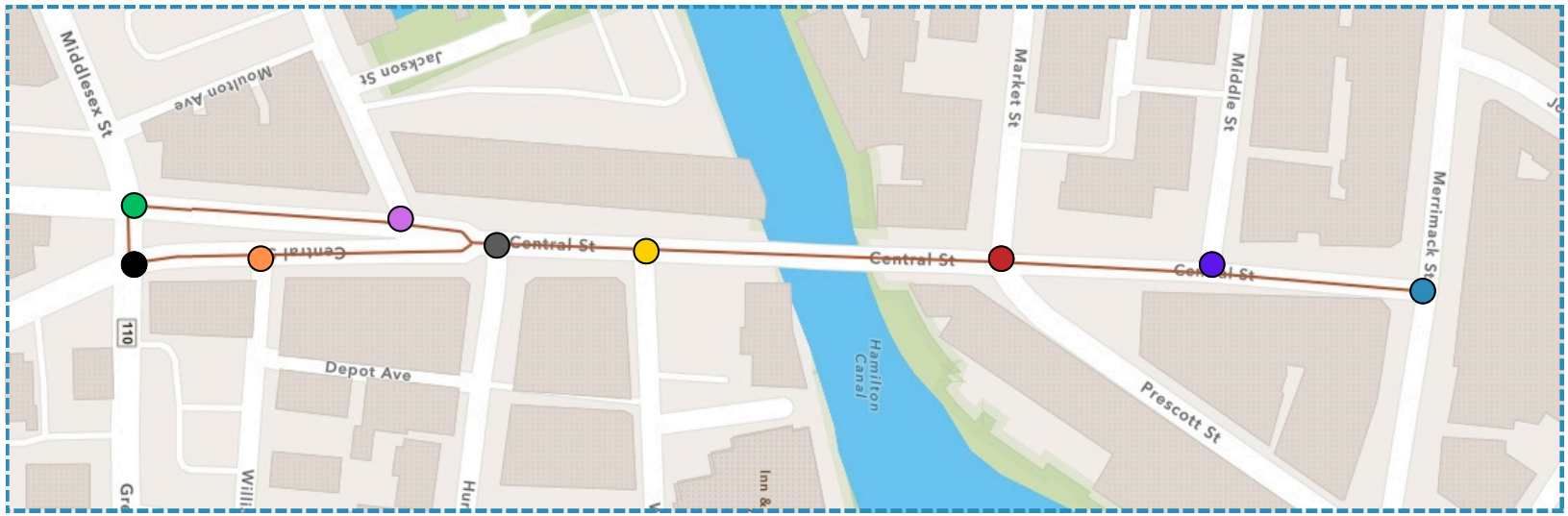
57% of the VRU crashes occurred while the pedestrians and bicyclists were entering a crosswalk attempting to cross. The highest number of VRU crashes occurred at the intersections of Central Street with Merrimack Street and with Jackson Street. Turning movements contributed to 50% of crashes and 20% of those occurred in the dark. Factors contributing to VRU crashes included operation of electronic devices, distracted driving, and visibility conflicts while pedestrians were crossing and vehicles are completing turning movements.

98	14	24
Crashes	VRU Crashes	Injured (All modes)

11 Single Vehicle	17 Rear End
38 Angle	21 Sideswipe
2 Head On	9 Other Factors

Intersection crashes

Crash Data Summary



Crash Summary

Manner of Collision

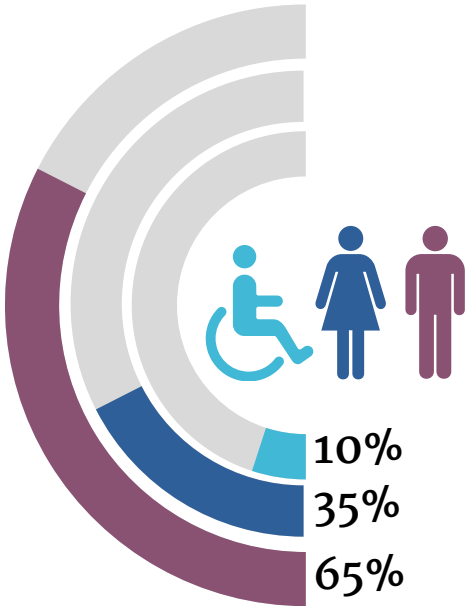
Intersection of Central Street with	Total Crashes	VRU Crashes	Injury (All modes)	Single Vehicle	Rear End	Angle	Sideswipe	Head On
Merrimack Street	19	3	5	1	2	7	6	
Middle Street	4	1		1	1	1		
Market Street	14	1	3	2	5	3	2	
Warren Street	8	1	2		1	4	2	
Hurd Street	7		2	1	1		5	
Jackson Street	12	4	2	2	2	6	1	1
Williams Street	3	1	1	1	2			
Green Street	10	1	3	2	2	2	2	
Middlesex Street	21	2	6	1	1	15	3	1
Total	**98**	**14**	**24**	**11**	**17**	**38**	**21**	**2**

Participants

Interested participants were asked to fill a short form online to gather basic information for further communications and to ensure the City was equipped to provide the required assistance (Language and ADA assistance).

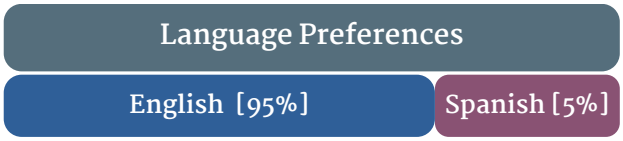
Residents who were unable to join on the walk audit day were provided an option of conducting the walk audit on their own. The questions were posted on the City's website for response within two weeks of the walk audit date. This effort was intended to provide opportunity to all residents to take part in the City's efforts to make the streets safer and more pedestrian friendly.

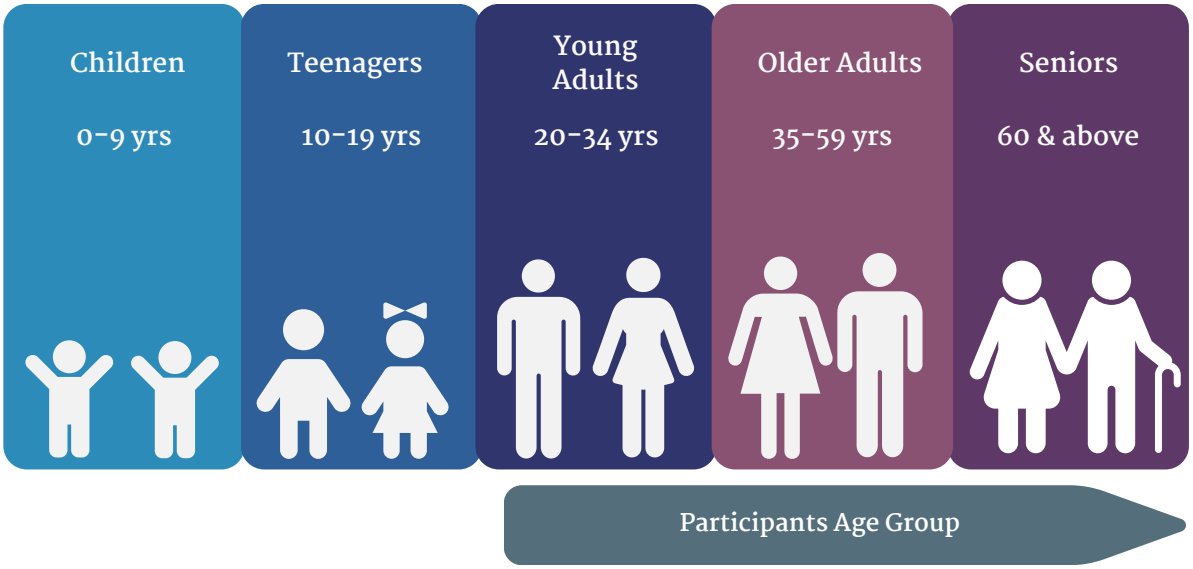
Participants providing inputs



Demographics distribution

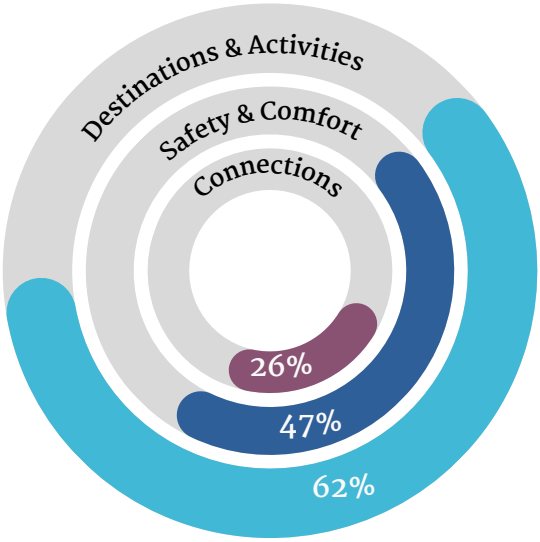
Registered participants were all residents of Central Street and the nearby streets. Age of the participants ranged between 30 and 70 years, two participants used a mobility device, and one of the participants required language assistance.





Observations

In this report, the observations and insights obtained from the participants are broadly classified into three categories: Safety & Comfort, Connections, and Destinations & Activities. The observations listed in the following sections include information collected from every participant.



Present condition of Central Street

Safety & Comfort

47% of the participants said they felt safe and comfortable walking along Central Street during the day. 45% of the participants said they felt safe and comfortable walking along Central Street at night. Participants felt well protected from the adjacent vehicular traffic (65%) but expressed concern over electric scooters and bikes being driven on the sidewalk due to lack of biking infrastructure on the street.

"As a business owner, I fear that someday customers might get hit by one of those scooters.

"Central St. has a wide area - that's wonderful. There are some sidewalk maintenance and crosswalk visibility issues that make pedestrians vulnerable."

Sidewalk on Central Street

The sidewalk is wide and easy to walk on. Concerns noted cracks in the sidewalks causing difficulty for those needing mobility assistance or pushing strollers. An even surface is easier to traverse for all users. Varying sidewalk treatments, including concrete and brick were noted to be difficult to transition for pedestrians using mobility devices.

Sidewalk approaching Hurd Street intersection

"We purposely avoid driving in this street. The street is very difficult to navigate between 2:30 pm and 6 pm."

The participants appreciated the street for the presence of multiple store fronts that acted as a shelter from rain and snow. Suggestions were made to add more benches, trash cans, and provide more lighting for better visibility and safety at night.

"There needs to be some traffic enforcement at the lights and crosswalks."

Connections

74% of the participants found it difficult to get to their destination by crossing Central Street. The visibility for pedestrians crossing at the mid-block crosswalks at Warran Street and Hurd Street was one of the biggest concerns noted on Central Street. The existing crosswalks along Central Street between Middle Street and Middlesex Street are constructed as concrete panels with slate borders and white stripes on the outside of the slate. This crosswalk construction is only found in the Downtown area, where a more visible striping treatment is used elsewhere in the City.

The crosswalk color makes them less visible for both the pedestrians and drivers, particularly at night. Vehicles tend to park immediately against the mid-block crosswalks, making pedestrians hard to see after they step off the sidewalk. Between Middlesex Street and Market Street, Central Street transitions from four vehicle travel lanes to two vehicle travel lanes.

This transition area was observed to be a hotspot for pedestrian-vehicle conflict. Parking spaces are perceived as under-utilized, which allows drivers to use the parking lane to bypass turning vehicles. Visibility again plays a major role in pedestrians traveling to their destination.

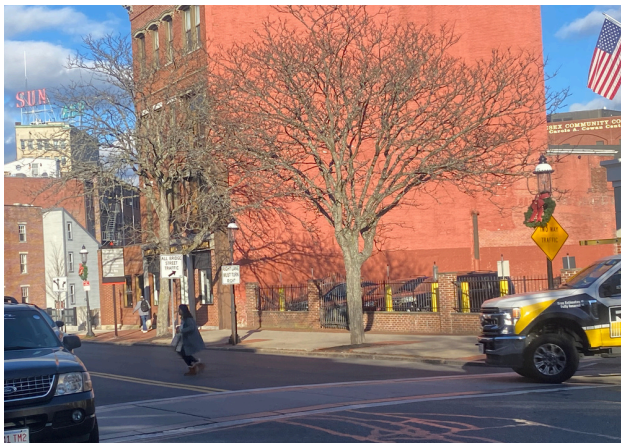
At the intersection of Central Street with Middlesex Street, the pedestrian push button to cross Central Street is placed at a distance from the crosswalk that is not ADA-compliant. The pedestrian indications (walk/don't walk) do not consistently provide countdown timers, which is the current design standard, along with audible push buttons to notify vision-impaired pedestrians when it is safe to cross.

"Walk signal timing is not enough for us to cross the entire street."

Car parked on crosswalk

While there is an exclusive pedestrian phase, it was observed that the pedestrian crossing time was inadequate to cross the entire width of Central Street, requiring pedestrians to stop on the median island. This causes pedestrians to cross mid-block through the median island instead of walking to a signalized crossing.

"I only walk through here when I absolutely have to. I cancelled a gym membership, so I didn't have to walk through this intersection."



Woman running to cross Central Street

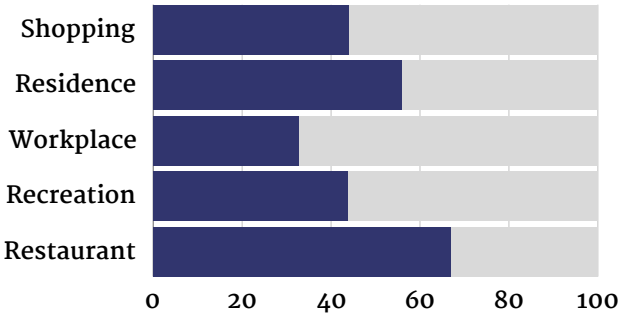
At the intersection of Central Street with Market Street, all of the pedestrian indications include countdown timers, and an exclusive pedestrian signal phase is provided. Participants noted that even through the right turn on red is restricted for vehicles traveling north on Central Street to Prospect Street, vehicles sometimes turn during the pedestrian phase.

Cars yielding for pedestrian at Warren Street

Signage for bus stops were noted to be unclear, limiting the potential to change travel modes if desired.

Destinations & Activities

Only 38% of the participants found the street to be walkable. Data on various destinations visited on Central Street was collected.



Participants' activity of choice along Central Street

"Many of the buildings have empty storefronts and are not necessarily places I would seek out. What could be done to encourage commercial development on this street?"

The chart indicates how Central Street caters to various usage. The cross streets have street signs, but it may be difficult for first-time visitors and tourists to determine where they are going and where to park. One participant suggested that the green space near the intersection of Central Street and Middle Street could be better utilized.

"Some empty store fronts would look much better with a tenant"

Participants noted that there were some empty storefronts on Central Street. The existing median with its trees and plants was acknowledged as attractive, however, the area did not feel like a specific destination.

Some participants were professionals who moved to Lowell from other cities and shared their experience on how the streets of Lowell compared to others.

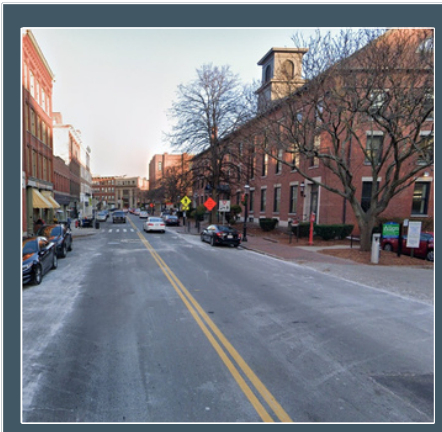
Existing wayfinding sign

Cobblestone streets were a popular theme, surprisingly even among bicyclists, as cars and trucks cannot speed even if they wanted to.

Storefronts at Central Street

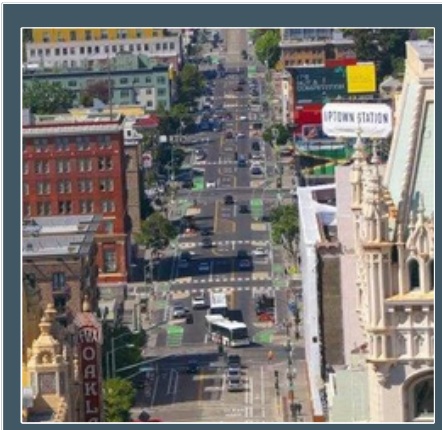
"Thanks for doing this! Prioritizing the things that can make DTL and Lowell neighborhoods more walkable is good for all of us."

Participants' Favorites!



Market Street,
Lowell MA

Merrimack Street,
Lowell MA



Telegraph Avenue,
Oakland CA

Recommendations

Improve pedestrian visibility and daylight crosswalks

Crosswalks were one of the biggest concerns to the participants as they were not visible to the drivers. Parked cars near intersections and on crosswalks can hinder visibility to both drivers and pedestrians.

Parked cars hinder pedestrian access & visibility

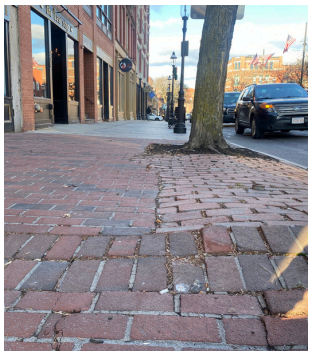
Short-term recommendations	Long-term recommendations
• Enforce parking regulations and ticket violators. • Mark parking spaces on Central Street between Hurd Street and Green Street and remove parking from within 20 feet of the mid-block crosswalks and the side street intersections. • Enforce right turn on red restrictions at intersections near crosswalks to eliminate conflicts with pedestrians crossing the street. • Daylight crosswalks using flex posts to define no parking zones near crosswalks.	• Install Rectangular Rapid Flashing Beacon (RRFB) at Central Street/Hurd Street and Central Street/Warren Street mid-block crossings. • Install curb bump outs at the mid-block crossings at Hurd Street and Waren Street to improve visibility. • Raise crosswalks to make pedestrians visible especially in the mid-block section of Central Street at Hurd Street and Warren Street intersections.

Truck stopped beyond the stop line

Painted crosswalks; Source: austintexas.gov

Repair sidewalks to create an even surface free of cracks

The sidewalk width is generous along the corridor walked and the surface is mostly even. Some sidewalk areas are in need of repair for cracks and non- ADA-compliant cross-slopes that make it uncomfortable for pedestrians using mobility devices and/or strollers. There are sections of the sidewalk that are made of brick that are deteriorating and should be replaced.

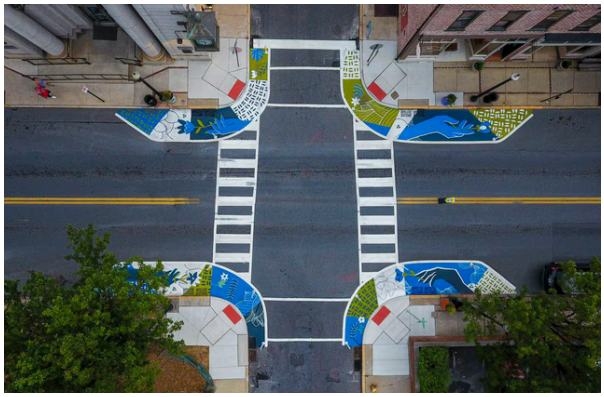



Uneven sidewalks on parts of Central Street

Short-term recommendations	Long-term recommendations
• Repair sidewalk panels or fill gaps and cracks that need immediate attention. • Reset or replace brick areas as necessary.	• Ensure all ramps are in compliance with ADA standards and add tactile warning surfaces. • Raise sidewalks wherever appropriate to create even surface for pedestrians. • Consider removing all brick surfaces.

Implement traffic calming strategies

Central Street attracts over 13,000 daily vehicles, including trucks and buses. These vehicles travel along the street with little to no consideration for pedestrians. To forcibly slow down the vehicles and improve pedestrian safety, implementing temporary and eventually adopting permanent traffic calming measures is vital for this street.



Painted bump outs; Source: leighvalleylive.com

Short-term recommendations	Long-term recommendations
• Pilot narrow travel lanes by placing temporary bike lanes, extended sidewalks and/or paint curb bump outs to guide traffic. • Identify potential intersections for creative placemaking program such as arts and murals on road and crosswalks by collaborating with local artists and residents.	• Implement successful temporary traffic calming strategies to create permanent installations, such as changing temporary painted bump outs to concrete bump-outs.

Implement road diet on Central Street

The length of Central Street between Hurd Street and Green Street has wide travel lanes and parking lanes that are under-utilized, and the absence of parked cars encourages drivers to use them as by-pass lanes. On-street parking is desirable for businesses and could aid in filling vacant storefronts. The width of the street outside of the parking lane may be an opportunity to pilot a bicycle lane.

Parking lane being used as travel lane

Short-term recommendations	Long-term recommendations
• Pilot protected bike lanes along the street to discourage people from driving on parking lanes and to narrow the travel lane.	• Implement road diet strategy based on pilot bike lane program results.

Pedestrian level lighting

Even though the walk audit took place in daytime hours, many participants expressed their concern about feeling unsafe to cross the road or even walk on the sidewalks due to poor lighting. The current street lighting along the street is not adequate to cover the width of the sidewalk.

Crosswalk lighting; Source: traffictechnologytoday.com

Short-term recommendations	Long-term recommendations
• Assess lighting conditions at night to find problem areas and to replace the light bulbs/lighting system.	• Study light levels and design lighting to improve visibility of crosswalks and for pedestrians walking at night.

Improve pedestrian safety and comfort

To encourage walking along Central Street, additional safety measures should be implemented. The street has residential, commercial and office land uses with parking on both sides and hosts a high daily traffic volume. While the sidewalks are wide and crosswalks connect curb to curb, additional infrastructure is needed to provide a safe and comfortable walking experience for the pedestrians.

Car stopped too close to sidewalk

Short-term recommendations	Long-term recommendations
• Narrow travel lanes between Hurd Street and Green Street by piloting a protected bicycle lane to reduce traffic speeds. • Install Rectangular Rapid Flashing Beacons (RRFB) to indicate mid-block pedestrian crossing locations. • Add benches, resting areas, and trash cans for pedestrians. • Review the traffic signal timing for pedestrian crossings at Central Street/Middlesex Street and Central Street/Market Street intersection. • Study the Central Street/Warren Street intersection for Stop sign/flashing beacon installation.	• Install curb bump outs at mid-block pedestrian crossings to reduce crossing distance. • Install Stop sign/flashing beacon at Central Street/Warren Street if the intersection qualifies. • Raise crosswalks for improving safety while crossing the street.